Space Weather Forecast

Issued on Thursday, 03 February 2022 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Minor Geomagnetic Storms late day 2 into day 3 (4th/5th). Chance of Moderate flares (R1/R2 Radio Blackouts) throughout.
Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low with a number of common class flares observed. The largest being from a region in the southeast, but this region has since seen some decay. There are two other large regions on the visible disc one in the northwest quadrant and one in the northeast. The final region currently on the disc remains a small simple region in the northwest.
No other Earth-directed coronal mass ejections (CMEs) were observed in available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind over the past 24 hours reflects the declining influence of a CME which left the Sun on the 29th January. Solar winds have been slightly elevated, but gradually declining from around 480 km/s to around 420 km/s. The magnetic field was initially moderate, but became weak from 02/0400 UTC. However, since 02/2015 UTC it has increased to moderate again. The important north-south component has generally been weakly positive, but a period of weak negative was observed 02/1340-1545 UTC. Geomagnetic activity was mainly Quiet to Unsettled (Kp 1-3), but an Active (Kp 4) interval was observed 02/0000-0300 UTC.

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low, with a continued chance (30%) of Moderate-class flares and a very slight chance (5%) of strong flare.

Solar Wind / Geomagnetic Activity: Slightly elevated solar winds are expected to decline to slow levels on day 1 (3rd), as weak CME influences wane. Solar winds may become elevated later on day 2 (4th), but more likely on day 3 (5th), due to a coronal hole. Winds are likely to remain enhanced on day 4 (6th). Quiet to Unsettled geomagnetic activity is generally expected, but with a chance of Active intervals early on day 1 (3rd) and late day 2 into day 3 (4th/5th). There's also a slight chance (10-20%) of a G1/Minor Storm interval in association with the arrival of the coronal hole.

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) is forecast to remain at background levels whilst the sunspots we are presented with remain quiet and stable, with no radiation storms currently expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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